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THIS IS UNEVALUATED INFORMATION FOR THE RESEARCH
USE OF TRAINED INTELLIGENCE ANALYSTSSOURCE Russian periodical, Stal', No 11, 1947. (Translation specifically requested.)THE ORE BASE OF FERROUS METALLURGY FOR 30 YEARS OF SOVIET RULEMining Engineer N. A. Yartsev and
Candidate of Technical Sciences V. A. Kulibin

In 1913, the record year for production of metal in prerevolutionary Russia, the smelting of pig iron reached 5.32 million tons (including 0.425 million tons smelted in Poland). In this year a record quantity of ores was extracted - 9.575 million tons, of which 72.5 per cent were in the Krivoy Rog basin and 19 per cent were in the Urals).

Progress has been such that in 1940 33 million tons of ore raw materials or 29 million tons of processed materials were produced, supplying a smelting of 14.5 million tons of pig iron. The smelting of 19.5 million tons of pig iron and extraction of 40 million tons of ore is designated for 1950 in the five-year plan. Comrade Stalin has set up the goal of smelting 50 million tons of pig iron and 60 million tons of steel per year, for which approximately 100 million tons of processed or 160 million tons of raw ores per year are necessary.

At the eleventh session of the International Geological Conference in Stockholm in 1911, the following figures on iron ores of Russia were presented.

Supplies (millions of tons)

Region	Ore	Metal	Content of Iron in the Ore (percent)
European Russia			
Urals	281.9	135.4	—
Central Russia	789.0	315.6	40
Kingdom of Poland	300.0	90.0	30
South Russia	536.0	233.3	40 - 62
Caucasus	14.0	8.3	50 - 60
Total	1920.9	782.6	—

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Region	Ore	Metal	Content of Iron in the Ore (percent)
Asiatic Russia			
Kirgiz Steppe	7.0	4.2	---
Eastern Siberia	14.0	7.6	---
Far East	1.0	0.4	---
Total	22.0	12.2	
All Russia	Total	1942.9	794.8

These figures are, on the one hand, extremely conservative since for all southern Russia the supply is estimated as 536 million tons, of which 450 were in the Kerchensk region and 86 million tons in Krivoy Rog. Even in 1911 the estimated yield of these deposits could have been calculated to be much greater than this.

On the other hand, the large figure of 789 million tons for Central Russia is of little value from the industrial point of view, as the character and condition of stratification of the ore and its dispersion over an enormous territory -- with small capacity and low content of iron -- did not permit the development of large-scale extraction of the ore.

Detailed prospecting of parts of these deposits (Tula and Lipetsk regions) has shown that their industrial significance was extremely small. Discarding this supply and the supply of 300 million tons for Poland, the real resources capable of being used industrially were only 844 million tons with 390 million tons of metal.

In 1925 the following estimates of supplies were made (millions of tons):

	Ore	Iron
Kerch'	450.0	180.0
Urals	395.0	197.0
Krivoy Rog	238.0	147.5
Siberia	46.1	27.1
Caucasus	15.2	9.1
Kazakh SSR	7.0	4.2
Far-Eastern Kray	6.0	3.6
	1157.3	568.5

The difference between these figures and those given for 1911 without Central Russia is approximately 300 million tons, accounted for as follows: 152 million tons for Krivoy Rog, 32 million tons for Siberia, and 113 million tons for the Urals. As the supply for Krivoy Rog in 1910 was estimated to be 280 million tons and the most important deposits of the Urals at approximately 300 million tons, these figures for 1925 can be taken as a sufficiently close determination of the true supplies of iron ores at the moment of the founding of the Soviet State.

According to the report of the Eleventh International Geological Conference in 1910 Russia occupied sixth place in world ore production and fourth place in metal production.

Considering the losses in exploitation, such supplies, even with the addition of the significant supplies of Central Russia, could not supply the development of ferrous metallurgy, necessary for the industrialization of the country.

It was necessary to increase considerably the extraction of ores and set up a program of planned development. Consequently geological prospecting work had to be greatly expanded and geological service completely reorganized, existing mines re-equipped and reconstructed and new ones constructed, and the whole system supplied with sufficient geological and mining personnel.

When the Ministry of Higher Education of the USSR was organized in 1946, 22 mining and mining-metallurgical institutes and five polytechnical institutes with mining-metallurgical departments were operating or an

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intensive schedule.

At the time of the organization of the Soviet State, the supplies of ores had been estimated at 1,157 million tons.

The wide inauguration of geological prospecting work increased the discovered supplies by several times.

The resources of Soviet ferrous metallurgy were not limited by this, however. By 1 January 1921 large supplies of ferrous quartzite had been located. These are poor ores which, however, after proper technological processing (concentration and agglomeration) become normal iron-ore raw materials for the production of metals. The main supplies were Krivoy Rog (10,672 million tons with a content of 35 to 45 per cent Fe), Kursk oblast, in the region of the Kursk magnetic anomaly (3,628.8 million tons with a content of 28 to 37 per cent Fe. Average 35 per cent).

On 1 January 1945 the estimated supplies of iron quartzites in the USSR reached colossal proportions. The threat of insufficient supplies of ore was considered liquidated.

The maximum possible extraction of iron ores in prerevolutionary Russia was reached in the record year 1913 (9.4 million tons). The productive capacity of mines according to separate regions in 1914 was as follows:

Region	Number of Mines			General Capacity (in millions of tons)
	Active	Inactive	Prospected	
South	47	4	1	6.72
Urals	180	278	21	2.03
Moscow area	50	5	—	0.53
North	—	58	23	0.16
Siberia	—	19	7	0.05
Total	277	364	52	9.49

Equal success was made in work on the organization of concentration of iron ores and processing ores for smelting.

During the first and second Stalin Five-Year Plans the concentration of iron ores was greatly developed. The construction of washing plants was begun on Letyashinskiy, Vysokogorskiy, Bakal'skiy, Vorortsovskiy, Ausrakhovskiy, and Samskiy mines; crushing plants on Blagodatkiy, Bakal'skiy and Pokrovskiy mines; and finally, the powerful crushing concentration and agglomeration plants of the grandiose Magnitogorsk ore-washing system.

Important problems of concentration were solved with the creation of the Mundyashskiy concentration-agglomeration system for processing ore of Temir-Tau and Tel'bessa, and Kanyshburunskiy for the limonite of the Kerchensk region.

Ores of Krivoy Rog do not demand concentration, but they must be sorted because of the high content of fines. The first agglomeration plants for these ores, constructed with the use of German equipment, were soon replaced by equipment built by Soviet institutions.

The large agglomeration plants of the south, Makeyevka, Kanyshburunskaya, Esprodzershiinsk, Ordshonikidze, Kerchensk and the Plant imeni Frunze, which were destroyed by the Hitler invaders, were quickly restored and soon will be working at full capacity. The number of ore-processing plants in the Soviet Union constantly increases, as the following data shows:

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Plant	1913	1937	1947
Crushing and crushing-concentrating	--	6	19
Washing	2	6	9
Calcinating	3	6	3
Briquetting	1	--	--
Agglomeration	--	9	13

In spite of the difficulties of war, strong concentration-agglomeration combines (Bakal'skiy, Vysokogorskiy) and agglomeration plants (Sarovskaya, Chusovskaya) were constructed during war years.

All of this greatly improved the domestic ore raw material. The amount of unprocessed ores entering domestic furnaces has sharply decreased during the years of Soviet power.

The valuable manganese ores of the Chiatura and Nikopol' regions were subjected to primitive concentration in the prerevolutionary era, as the rich ores of Chiatura were heavily worked by 1913, and the Nikopol' clay ores generally cannot be used without washing.

Concentration is not yet sufficiently applied on the eastern deposits of manganese ores which have exceptional significance in war years.

According to the law on the new five-year plan, 40 million tons of processed ores or approximately 50 million tons of raw ores must be produced in 1950.

The mines of Krivoy Rog and Kerch, on which 50 per cent of this program is based, were completely destroyed by the enemy in the years of the war, but are being restored and in the near future will not only reach but also surpass their prewar capacity. New iron-ore enterprises are being constructed in the Caucasus, the Urals, in Siberia, and in the Far East. Numerous new concentration and agglomeration plants are being built.

At the moment of the foundation of Soviet rule the supplies of iron ores in Russia could supply a smelting of not more than 18 million tons of pig iron for a period of 30 years, but by the thirtieth anniversary of the Great October Socialist Revolution the supply easily provides the yearly smelting of 50 million tons of pig iron and more.

The productive capacity of mines in 1914 did not exceed 9.6 million tons of ores per year, and which supplied a smelting of 4.5 million tons of pig iron. But, by the thirtieth anniversary of Soviet power, the productive capacity of mines had become many times greater and completely guarantees the fulfillment of the State plan for smelting of pig iron.

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